<div align="center">

Single Variable Calculus I
Fall 2025 CRN: 43513 Credit Hours: 4
Math 1850 Sec. 040 MWF 2:30 - 3:25 PM   Location: Room: Health Sci and Human Services 2615
Recitation Sec. 041 TR 8:30 - 9:25 AM   Room: Gillham Hall 2300
Recitation Sec. 042 TR 2:30 - 3:25 PM   Room: Gillham Hall 2300

</div>

Instructor:	Dr. David Gajewski
Office:	University Hall 3014
Office Hours:	MWF 1:00-2:30, R 4:30-5:30, and also by appointment
Phone:	530-3253
E-Mail:	david.gajewski@utoledo.edu (note: not @rockets.utoledo.edu)
Recitation Instructor:	Farjana Akter Farjana.Akter@rockets.utoledo.edu

COURSE DESCRIPTION

Limits, differentiation, Fundamental Theorem of Calculus, curve sketching, maxima/minima, definite and indefinite integrals, applications.

PREREQUISITES

Before enrolling in MATH 1850, students must attain sufficient ACT MATH, College Algebra and Trigonometry placement test results or minimum grade of C- in MATH 1320 and MATH 1330 or MATH 1340. Students with marginal trig placement test scores take MATH 1980 concurrently. For details on the scores on the ACT MATH, College Algebra and Trigonometry placement tests required for MATH 1850, see the Department's placement table.

TEXTBOOK: *Calculus – Volume I*, OpenStax (ISBN: 9781938168024), Contributing Authors: Edwin Jed Herman and Gilbert Strang. The book is available for free at https://openstax.org/details/books/calculus-volume-1.

GRADING AND EVALUATION

% Score	Grade
90-100	A-/A range
80-89.99	B-/B/B+ range
70-79.99	C-/C/C+ range
60-69.99	D-/D/D+ range
< 60	F

Minus and plus grades will be awarded for grades within 2.5% of the lower and upper ends of the given ranges. Example: 80-82.49 B- / 82.5-87.74 B / 87.5-89.99 B+. The University of Toledo does not offer A+ grades. For Midterm Grading the scale and methods are the same, except that only one quiz score will be dropped and the first test will fill in for the other two tests and the final exam (amounting to 70% of the midterm grade).

Component	points
Homework	12.5%
Quizzes	17.5%
Three (3) Exams	45%
Final Exam	25%

ONLINE HOMEWORK

Homework for this course is online and is located at http://www.webassign.net and is also linked from Blackboard. Late homework will have a 40% penalty. Students must purchase a WebAssign Access Code.

QUIZZES

There will be weekly quizzes. The lowest two quiz scores will be dropped. No calculators are allowed on either quizzes or exams.

TESTS AND FINAL EXAM

There will be 3 tests one after each 4 weeks. Tentatively they will be held on September 26, October 24, and November 21, 2025. The final is comprehensive and will be held on **Friday December 12, 2025 10:15-12:15am** in a yet to be determined room. Please note that the final exam may not be taken early under any circumstances in accordance with department policy.

IMPORTANT DATES

The instructor reserves the right to change the content of the course material if he perceives a need due to postponement of class caused by inclement weather, instructor illness, etc., or due to the pace of the course.

Last day to add/drop this class: Monday September 8 2025
Last day to withdraw from this class with a grade of W: Friday October 31 2025

MISSED CLASS POLICY

If circumstances occur in accordance with "The University of Toledo Missed Class Policy" (found at `http://www.utoledo.edu/policies/academic/undergraduate/index.html`) result in a student missing a quiz, test, exam or other graded item, the student must contact the instructor in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.

INSTITUTIONAL CLASSROOM ATTENDANCE POLICY

Please be aware that the university has implemented an attendance policy, which requires faculty to verify student participation in every class a student is registered at the start of each new semester/course. For this course, if you have not attended/participated in class (completed any course activities or assignments) within the first 14 days, I am required by federal law to report you as not attended. Unfortunately, not attending/participating in class impacts your eligibility to receive financial aid, so it is VERY important that you attend class and complete course work in these first two weeks. Please contact me as soon as possible to discuss options and/or possible accommodations if you have any difficulty completing assignments within the first two weeks.

ACADEMIC DISHONESTY

Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at `http://www.utoledo.edu/dl/students/dishonesty.html`) will result in an F in the course or an F on the item in question, subject to the determination of the instructor. In particular, tests, quizzes, homework and exams must be entirely the student's own work and any use of outside websites, apps, generative Artificial Intelligence (AI), technology or persons to assist with completing these items will be considered academic dishonestly.

POLICY STATEMENT ON NON-DISCRIMINATION ON THE BASIS OF DISABILITY (ADA)

The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance. Students can find this policy along with other university policies listed by audience on the University Policy webpage (`http://www.utoledo.edu/policies/audience.html/#students`).

ACADEMIC ACCOMMODATIONS

The University of Toledo embraces the inclusion of students with disabilities. We are committed to ensuring equal opportunity and seamless access for full participation in all courses. For students who have an Accommodations Memo from the Office of Accessibility and Disability Resources, I invite you to correspond with me as soon as possible so that we can communicate confidentially about implementing accommodations in this course.

For students who have not established accommodations with the Office of Accessibility and Disability Resources and are experiencing disability access barriers or are interested in a referral to health care resources for a potential disability, please connect with the office by calling 419.530.4981 or sending an email to `StudentDisability@utoledo.edu`.

RELIGIOUS ACCOMMODATIONS

A student is permitted to be absent, *without penalty*, for up to three days each academic <u>semester</u> to take holidays for reasons of faith or religious or spiritual belief system or to participate in organized activities conducted under the auspices of a religious denomination church, or other religious or spiritual organization. See 3364-71-30 Religious accommodations policy (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-30%20Religious%20accommodations.pdf`) and 3364-71-30.01 Religious accommodations procedure (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-30%2001%20Procedure%20religious%20accommodations.pdf`)

GRIEVANCE PROCEDURE

A student may notify the institution of any grievance regarding the policy's implementation using the 3364-71-05.1 Academic grievance procedure (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-05-1_AcademicGrievanceProcedure.pdf`).

ACADEMIC AND SUPPORT SERVICES

Please follow this link to view a comprehensive list of Student Academic and Support Services available to you as a student: `http://www.utoledo.edu/success/`

SAFETY AND HEALTH SERVICES FOR UT STUDENTS

Please use the following link to view a comprehensive list Campus Health and Safety Services (`http://www.utoledo.edu/offices/provost/utc/docs/CampusHealthSafetyContacts.pdf`) available to you as a student.

STUDENT PRIVACY

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the "Confidentiality of Student Records (FERPA)" section of the University Policy Page at `http://www.utoledo.edu/policies/academic/undergraduate/index.html`

OTHER UNIVERSITY POLICIES

Refer to the student handbook at `http://www.utoledo.edu/studentaffairs/pdfs/handbook.pdf`

RESOURCES

Free math tutoring on a walk-in basis is available in the Math Learning and Resources Center located in Rm B0200 in the lower level of Carlson Library (phone ext 2176). The Center operates on a walk-in basis. MLRC hours can be found at `http://www.math.utoledo.edu/mlrc/MLRC.pdf`

CLASS SCHEDULE

Chapter	1	**Functions**	(total 4 hr)
	1.1	**(Op.)** Review of Functions	
	1.2	**(Op.)** Basic Classes of Functions	
	1.3	Trigonometric Functions	1
	1.4	Inverse Functions	1
	1.5	Exponential and Logarithmic Functions	2
Chapter	2	**Limits and Continuity**	(total 5 hr)
	2.1	**(Op.)** A Preview of Calculus	
	2.2	The Limit of a Function; *Limits*	1.5
	2.3	The Limit Laws; *Limits*	2
	2.4	Continuity; *Continuity*	1.5
Chapter	3	**Differentiation**	(total 11 hr)
	3.1	Defining the Derivative; *Derivatives*	1
	3.2	The Derivative as a Function; *Derivatives*	1
	3.3	Differentiation Rules; *Derivatives*	1.5
	3.4	Derivatives as Rates of Change; *Derivatives*	1
	3.5	Derivatives of Trigonometric Functions; *Derivatives*	1
	3.6	The Chain Rule; *Derivatives*	1.5
	3.7	Derivatives of Inverse Functions; *Derivatives*	1.5
	3.8	Implicit Differentiation; *Derivatives*	1
	3.9	Derivatives of Exponential and Logarithmic Functions; *Derivatives*	1.5
Chapter	4	**Applications of Derivatives**	(total 9 hr)
	4.1	Related Rates; *Higher Order Derivatives*	1
	4.2	Linear Approximations and Differentials; *Derivatives*	1
	4.3	Maxima and Minima; *Graph Sketching*	1.5
	4.4	**(Op.)** The Mean Value Theorem	
	4.5	Derivatives and the Shape of a Graph; *Graph Sketching*	1.5
	4.6	Limits at Infinity and Asymptotes; *Graph Sketching*	1
	4.7	Applied Optimization; *Graph Sketching*	2
	4.8	L'Hôpital's Rule; *Indeterminate Forms*	1
	4.9	**(Op.)** Newton's Method	
	4.10	**(Op.)** Antiderivatives	
Chapter	5	**Integration**	(total 7 hr)
	5.1	Approximating Areas; *Antiderivatives*	1
	5.2	The Definite Integral; *Antiderivatives*	1.5
	5.3	The Fundamental Theorem of Calculus; *Antiderivatives*	1.5
	5.5	Substitution; *Antiderivatives*	1
	5.6	Integrals Involving Exponential and Logarithmic Functions; *Antiderivatives*	1
	5.7	Integrals Resulting in Inverse Trigonometric Functions; *Antiderivatives*	1
Chapter	6	**Applications of Integration**	(total 1 hr)
	6.1	Areas between Curves; *Antiderivatives*	1
		Total Hours	37

LEARNING OBJECTIVES

The successful Calculus I student should be able to apply the following competencies to a wide range of functions, including piecewise, polynomial, rational, algebraic, trigonometric, inverse trigonometric, exponential and logarithmic:

- ***Limits:*** Determine the existence of, estimate numerically and graphically and find algebraically the limits of functions. Recognize and determine infinite limits and limits at infinity and interpret them with respect to asymptotic behavior.

- ***Continuity:*** Determine the continuity of functions at a point or on intervals and to distinguish between the types of discontinuities at a point.

- ***Derivatives:*** Determine the derivative of a function using the limit definition and derivative theorems. Interpret the derivative as the slope of a tangent line to a graph, the slope of a graph at a point, and the rate of change of a dependent variable with respect to an independent variable.

- ***Indeterminate Forms:*** Evaluate limits that result in indeterminate forms, including the application of L'Hopital's Rule.

- ***Higher Order Derivatives:*** Determine the derivative and higher order derivatives of a function explicitly and implicitly and solve related rates problems.

- ***Graph Sketching:*** Determine absolute extrema on a closed interval for continuous functions and use the first and second derivatives to analyze and sketch the graph of a function, including determining intervals on which the graph is increasing, decreasing, constant, concave up or concave down and finding any relative extrema or inflection points. Appropriately use these techniques to solve optimization problems.

- ***Antiderivatives:*** Determine antiderivatives, indefinite and definite integrals, use definite integrals to find areas of planar regions, use the Fundamental Theorems of Calculus, and integrate by substitution.